

ABSTRACT OF THE DISCLOSURE

- A method for single molecule identification of a target DNA molecule in a random coil state having the following steps: a) attaching an
- 5 optically distinguishable material to a DNA sequence recognition unit; b) hybridizing the DNA sequence recognition unit to the target DNA molecule in a random coil state to form a hybridized DNA complex in a random coil state; c) stretching the hybridized DNA complex in a random coil state to form a hybridized DNA complex in a substantially linear configuration; and d) detecting
- 10 the optically distinguishable material in a sequential manner along the substantially linear hybridized DNA complex, thereby identifying the target DNA molecule.